

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following discussion, is respectfully requested.

Claims 1 and 3-5 are pending in the present application. By this amendment, Claim 1 is amended; and no claims are added or canceled herewith. It is respectfully submitted that no new matter is added by this Amendment.

In the outstanding Office Action, Claims 1 and 3-5 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,183,627 to Friday.

Friday does not teach or suggest a step of thermally cracking in a thermal cracking section, the heavy oil content obtained directly from a bottom of the distilling section so that a lightened thermally cracked product and residues of pitch or coke are produced, and a step of removing the residues of pitch or coke from the thermally cracking section, as recited in Claim 1.

In contrast, as described in Friday at column 3, lines 36-56, the mild thermal cracking in Friday requires that the process must avoid fouling as much as possible due to condensation and coking reactions, when increasing a reaction severity. That is because the invention in Friday, like other inventions relating to the mild thermal cracking process, does not utilize a device for removing coke or pitch during the process. Therefore, coke or pitch cannot be produced. Accordingly, if the solvent deasphalting step is eliminated from Friday, a condensed large molecule produced in a thermal cracking reaction is recycled and accumulated in the processing system of Friday because there is no way for it to be drawn off from the processing system. As a result, if the solvent deasphalting step is eliminated in Friday, residues of coke or pitch would accumulate in the processing system. The accumulation of such a condensed large molecule that is unstable makes the thermal cracking process less severe and would result in heavy fouling and deposition of coke or pitch causing

the processing system to stop operating. Accordingly, in Friday, the solvent deasphalting step provides an essential function without which the processing system cannot operate.

In this regard, the residue thermal cracking in Friday does not teach having a device for removing coke or pitch. Such thermal cracking is known as a mild thermal cracking which includes solvent deasphalting where the severity of residue cracking is mild. Because the mild thermal cracking in Friday occurs in the liquid phase, and cracked light product is not separated from residue remaining in the same liquid phase, residual fuel oil is produced as well as cracked gas, distillate oil. In such mild thermal cracking, the reaction is mild; and the reaction is kept in a liquid phase.

In contrast, according to the claimed invention, a thermal cracking section is configured to thermally crack the heavy oil content obtained directly from a bottom of the distilling section so that a lightened thermally cracked product and residues of pitch or coke are produced. Further, the residues of pitch or coke are removed from the thermal cracking section. Accordingly, the features of Claim 1 provide for removing coke or pitch. As such, the severity of residue cracking is maximized (i.e., the severity is higher than the mild thermal cracking in Friday).

In such a process, since the cracked light product is vaporized and separated from liquid phase of cracked residue that will eventually become coke or pitch, the residue conversion to light product is maximized so that cracked gas, distillate oil and coke or pitch are produced but no residual fuel oil is produced.

Again Claim 1 recites the step of removing the residues of pitch or coke from the thermal cracking section. Thus, coke or pitch is produced and drawn off from the processing system. Since the thermal cracking process of exemplary embodiments of the present invention is to be utilized not for selective reactions to certain products, but for a broad range of productions from light to heavy materials including coke precursors with the above-noted

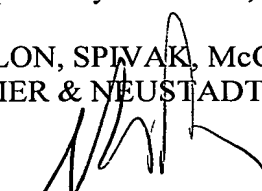
condensed large molecule, the feature of drawing off the heavy materials from the processing system with a thermal cracking is essential at the more severe conditions and higher conversion. Such intended production of coke or pitch is clearly different from unintended accumulation of coke or pitch in Friday because no problems, such as fouling and deposition of coke or pitch, occur as the coke or pitch produced is drawn off from the processing system. Accordingly, Applicants respectfully request the withdrawal of the rejection of Claim 1 and dependent Claims 3-5.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Kevin M. McKinley
Registration No. 43,794

Robert T. Pous
Registration No. 29,099

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 03/06)

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